PATENT SPECIFICATION

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COMPLETE SPECIFICATION

NO DRAWINGS

Bone Implants and Drills and Taps for Bone Surgery

I, SAMI SANDHAUS, an Israeli citizen of 24 Chemin de la Vallonette, Lausanne, Switzerland, do hereby declare the invention for which I pray that a patent may be granted to me and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to bone implants or inserts, and tools for bone surgery.

Up to the present, materials employed for implants in bone surgery are metals such as gold, silver or steel, and synthetic organic materials. These materials present disadvantages. The metals may dissolve, slowly or rapidly, under the action of the liquids present in the body. It is, in particular, known that metallic implants in bone employed in dentistry may dissolve under the combined action of saliva and blood acting simultaneously, these two liquids often having different pH which may give rise to corrosive electric currents. Furthermore, implants constituted by synthetic organic materials, such as nylon for example, may also be attacked by the liquids of the body. Often, these organic materials may also release into the body harmful substances, for example softening agents.

The present invention has for its object to avoid these disadvantages, by creating bone implants and tools for bone surgery not presenting the above mentioned disadtages of metals and synthetic organic materials. According to the invention bone implants and drills and taps for bone surgery consist of oxide-ceramic material. Such material is tolerable biologically and physiologically, compatible with its biological surroundings, non-conductive of electricity, and has mechanical qualities necessary for its use.

An implant into a bone may be made by drilling a hole into the bone by means of a drill, treating said hole with a screw tap, and inserting a screw-shaped implant in said hole; said drill, tap and implant each consisting of oxide-ceramic material.

The oxide-ceramic material is such as is employed as cutting ceramics for machining steel. It exists on the market in particular under the trade mark "Degussit" (manufactured by the Degussa firm in Germany). A typical example of "Degussit" is constituted by aluminium oxide (Al_2O_3) of a pureness of at least 99.5% with traces of chromium oxide (Cr_2O_3), calcined and solidified at about 1900°C. This calcined material is composed of very small crystallites of —Al_2O_3 intimately co-mingled. It presents the following properties: specific weight 3.7 — 4 g/cm³; hardness to the Mohs scale 9; resistance to pressure 300 kg/mm²; resistance to bending 50 kg/mm².

Other examples of "Degussit" are constituted by aluminium oxide calcined at high temperatures (1000-1900°C) in the presence of small quantities of binding agents such as Mo, TiC, Mo_2C, SiO_2, MgO. Moreover, one may also employ "Degussit" materials constituted by the BeO, MgO or ZrO_2 oxides calcined at a high temperature.

The oxide-ceramic material according to the present invention can be used for all kinds of implants in bone surgery, but it is especially advantageous for implants for the jaw bones. Such implants, after insertion, are used to fix thereon artificial teeth. The insertion of the implants into the bones, especially into the jaw bones, is made by drilling a hole into the bone, treating this hole with a screw tap, and inserting a screw-shaped implant into the hole, the drill and tap used, as well as the implant consisting of said oxide-ceramic material, and especially one of the above-mentioned "Degussit"

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materials.

WHAT I CLAIM IS:—

1. Bone implants and drills and taps for bone surgery, consisting of oxide-ceramic material.

2. Bone implants and drills and taps for bone surgery, according to claim 1, consisting of aluminium oxide of a purity of at least 99.5% with traces of trivalent chromium oxide, said aluminium oxide having been fired and solidified at about 1900°C.

GEE & CO.
Chartered Patent Agents,
51-52 Chancery Lane, London, W.C.2.
and
22 Whitefriargate, Hull.
Agents for the Applicant.

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